

## **DROP-BIN CONTAINERS AND HOLDERS FOR SAME**

### **Reference to Related Application**

This is a continuation-in-part of application no. 09/422,964, filed October 22, 1999.

### **BACKGROUND OF THE INVENTION**

This invention relates to compartmentalized containers for objects, particularly intended for hardware items and tool components, but useful for a wide variety of purposes. Other uses could include, for example, cosmetic kits, fishing tackle, organizers for medication, storage for pens, pencils, crayons, storage for various condiments in the kitchen, organizers for women's trinkets, hobby kits, recreational items, sewing kits, etc.

Although many containers exist, of course, there is always a need for new and improved containers which are easy and convenient to market and to use, and which can be easily carried around by a person, if desired (either one at a time, or several at a time).

### **SUMMARY OF THE INVENTION**

In the invention, a "drop-bin" unit is provided, i.e. a unit having at least several bins arranged to pivot outwardly about a generally horizontal axis, from a closed position where outer faces of the bins are generally aligned vertically with each other, to an open position where the outer surfaces angle outwardly from their closed positions. The bins are stacked one above another within a housing, and are connected together, for example via at least one gang bar, such that pivoting one bin outwardly causes all of the bins to pivot outwardly in unison.

The housing has connection means configured to engage connection means of a housing of another container unit.

The connection means preferably comprise male and female connectors arranged on opposite sides of the housing.

The housing advantageously has a readily-disengageable flexible clip to engage a bin to hold the bins in the closed position.

A combination of at least two container units are preferably attached to each other via the connection means.

The housing preferably has a tab extending upwardly from an upper surface thereof, the tab having an opening for hanging the container unit.

The tab is either foldable against the upper surface or removable from the housing, so as not to interfere with the connection of the container unit with another container unit.

The units in holders provide great flexibility for carrying job-specific items, e.g. seals and washers for plumbing jobs, Marrette™ connectors, assorted terminals, etc. for electrical jobs, and so on. Using a holder which can carry a number of drop-bin units allows the user to remove and replace units as desired, thus avoiding the need to carry an entire toolbox to a particular job.

Further features of the invention will be described or will become apparent in the detailed description which follows.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

In order that the invention may be more clearly understood, the preferred embodiment thereof will now be described in detail by way of example, with reference to the accompanying drawings, in which:

Fig. 1 is a perspective view of the preferred embodiment of the drop-bin unit, with the bins open;

Fig. 2 is a corresponding view with the bins closed;

Fig. 3 is a top view of the unit;

Fig. 4 is a front view of the unit;

Fig. 5 is a top cross-sectional view of the unit;

Fig. 6 is a side cross-sectional view of the unit, with the bins closed;

Fig. 7 is a side cross-sectional view of the unit, with the bins open;

Fig. 8 is a rear view of the unit;

Fig. 9 is a perspective view of the rear of the unit;

Fig. 10 is a side cross-sectional view showing a clip on the rear of the unit;

Fig. 11 is a perspective view showing the unit with the clip;

Fig. 12 is a side cross-sectional view showing magnets on the rear of the unit;

Fig. 13 is a perspective view showing the unit with the magnets;

Fig. 14 is a front view showing a holder with three units mounted therein;

Fig. 15 is a top cross-sectional view showing the holder and units of Fig.

14;

Fig. 16 is a side cross-sectional view showing the holder and units of Fig. 14, with the bins open;

Fig. 17 is a perspective view showing a similar holder to that of Figs. 14-16, but with a carrying handle;

Fig. 18 is a side cross-sectional view showing two holders, mated with each other back-to-back;

Fig. 18A is a close-up cross-sectional view showing the connection between a housing of one of the units, and one of the Fig. 18 holders;

Fig. 19 is a front view showing the holders of Fig. 18;

Fig. 20 is a top cross-sectional view of the Fig. 18 holder;

Fig. 20A is a close-up cross-sectional view showing the connection between the Fig. 18 holders;

Fig. 21 is a side cross-sectional view of a holder similar to that of Fig. 18, but fully covering the sides of the units;

Fig. 22 is a front view showing the holder of Fig. 21;

Fig. 23 is a top cross-sectional view showing the Fig. 21 holder;

Fig. 24 is a top cross-sectional view showing a holder which has two section which are hinged to each other, shown folded shut;

Fig. 25 is a top cross-sectional view showing the Fig. 24 holder, folded open;

Fig. 26 is a front cross-sectional view showing a carousel arrangement of several units;

Fig. 27 is a top cross-sectional view of the Fig. 26 holder;

Fig. 28 is a perspective view showing a cylindrical version;

Fig. 29 is a perspective view showing the Fig. 28 version with the bins open;

Fig. 30 is a top cross-sectional view of the Fig. 28 version;

Fig. 31 is a perspective view showing a holder with three units arranged in a triangular fashion;

Fig. 32 is a top cross-sectional view showing the Fig. 31 holder;

Fig. 33 is an exploded perspective view showing the units mountable in a tool box

Fig. 34 is a side view showing an alternative means of ganging the bins, with the bins closed;

Fig. 35 is a side view showing the same alternative means of ganging the bins, with the bins open;

Fig. 36 is a perspective view corresponding to Fig. 2, showing an embodiment where the bins are not of uniform width;

Fig. 37A is a front view of one embodiment of modules attachable directly to each other;

Fig. 37B is a top view of the modules shown in Fig. 37A;

Fig. 38A is a front view of a single module of Fig. 37A;

Fig. 38B is a side view of the module shown in Fig. 38A;

Fig. 38C is a further side view of the module shown in Fig. 38A;

Fig. 39A is a front view of a further embodiment of modules attachable directly to each other;

Fig. 39B is a top view of the modules shown in Fig. 39A;

Fig. 40A is a front view of a single module of Fig. 39A;

Fig. 40B is a side view of the module shown in Fig. 39A;

Fig. 40C is a further side view of the module shown in Fig. 39A;

Fig. 40D is a top view of the module shown in Fig. 39A;

Fig. 41A is a front view of modules attached to each other, showing a handle attachable to the connection means used to attach modules; and

Fig. 41B is a top view of the modules shown in Fig. 41A.

## **DETAILED DESCRIPTION OF THE INVENTION**

5           The preferred embodiment of the "drop-bin" unit **1**, seen most clearly in Figs. 1 and 2, can be sold and used on its own, or can be sold on its own intended to be used as part of a larger system, or sold together with a larger system. The unit has several bins **2** arranged to pivot outwardly about a generally horizontal axis. Fig. 1 shows the bins pivoted outwardly to an open position, and Fig. 2 shows the bins in their  
10 closed position where outer faces **3** of the bins are generally aligned vertically with each other.

          The larger system could be, for example, a holder which is configured to receive one or many such drop-bins. The holder could be, for example, a holder **50** as shown in Fig. 14. This and other holders are described in detail below, as specific examples only. Alternatively, the holder could be a tool box **59**, as shown in Fig. 33, i.e. one or more units could be fitted into recesses in the outside **60** of a tool box or could be snapped below the lid **61** of the tool box.

          More will be said about various holder options later, but first the preferred embodiment of the drop bin unit will be described in detail.

20           Within each drop-bin unit **1**, the bins **2** are stacked one above another within a housing **4**, and are connected together, for example via at least one gang bar **5** connecting the bins to each other, such that pivoting one bin outwardly causes all of the ganged bins to pivot outwardly in unison. There could be one gang bar only, or one gang bar along each side of the bins. Alternatively, the bins could be connected in the  
25 manner shown in Figs. 34 and 35, described in greater detail below, or in any other suitable fashion.

          Each gang bar is connected to the bins by protruding pins **6** located along its length which fit into holes in the side walls of each bin. Alternatively, it should be clear that the pins could protrude from the side walls of each bin, to fit into holes in the  
30 gang bar. The bins pivot in the housing via pins **7** on either side of the bins. Obviously,

these could be pins extending from the bins into holes or depressions in the housing, or vice versa.

The bins are kept in their closed position by a flexible plastic tab **8** at the top of the housing, the tab having a lip extending just slightly downwardly to catch the uppermost bin. The tab could be configured as shown in Figs. 1 and 2, or with slots on either side thereof as in Fig. 3, for cantilevering to promote flexibility. Any other suitable means of securing the bins to the housing could be used. To open the bins, pulling slightly on one of them is enough to disengage the tab **8**, to allow the bins to rotate. Alternatively, in some embodiments, it could be made necessary that the tab must be manually dislodged in order for the bins to be openable. Closing the bins causes the lip to catch the uppermost bin slightly, so that they remain closed until pulled outwardly again.

The entire unit preferably is molded plastic, but the entire assembly and/or one or more of the bins could be of metal or other suitable material, to permit other uses. For example, the unit to be used as a combination ashtray/coin holder.

Preferably, each drop-bin unit is fitted with a tab **10**, with a hole for hanging on a peg hook at the point of sale or in the purchaser's workshop. The tab can be fixed, but preferably has a living hinge where it joins the body of the housing, so that it can be folded flat, as shown in Fig. 13, if the unit is to be snapped into a holder. Alternatively, it can be frangible, so that it can be broken off by the purchaser if desired, or otherwise easily removable from the drop-bin unit.

Preferably, each unit can also have keyhole opening **11** on a rear surface, for hanging the unit on a nail, screw, etc.

Optionally, as shown in Figs. 10 and 11, each unit can be provided with a molded/detachable clip **14** that can enable clipping on a rail (individually or side-by-side) or carrying on a belt or in a pocket.

Alternatively, as shown in Figs. 12 and 13, the units can be fitted with one or more adhesive-backed magnets **16** to facilitate mounting on any metal surface, i.e. the side of a metal tool box, refrigerator, etc.

Similarly, the units could have a Velcro™ hook or pile strip (not shown) that would allow it to be secured to a counterpart strip on another object, for example the sun visor in an automobile.

Larger systems can be assembled by fitting individual drop-bin units together, either back-to-back or side-by-side, using a variety of means, i.e. pins and holes, slots, tongue-and-groove, etc.. Alternatively, larger systems can be assembled by snapping one or more units into various holders, as mentioned previously. Various holder options will now be described in greater detail.

As shown in Figs. 14-16, for example, a separate holder **50** can be provided that will enable drop-bins to be snapped in. As seen in Figs. 1 and 2, the units preferably have two tabs **51** at the bottom thereof, to insert into corresponding slots in the holder **50**. The units also preferably have two springy catches **52** at the top thereof, with a lip portion which projects slightly upwardly, such that when the tabs **51** are inserted, and the unit is then rotated into the holder, the catches **52** cause the lip portions to snap into corresponding slots in the top of the holder. The units can be removed by depressing the catch slightly to disengage the lip portions from the slots.

Figs. 14 -16 show a holder with three units mounted therein. Obviously, however, there could be only one unit, if desired, or many.

As illustrated in various drawings, the holder can be fabricated with a handle for carrying (e.g. Fig. 17), and/or keyhole openings at the rear for wall mounting (Fig. 19).

Fig. 18 is an example showing two holders **50** and **50'**, mated with each other back-to-back. Fig. 18A shows one example of how the housings **4** can be connected to the holder **50**. Fig. 19 is a front view showing the holders of Fig. 18. Fig. 20 is a top cross-sectional view. Fig. 20A is a close-up cross-sectional view again showing one example of how the housings **4** can be connected to the holder **50**.

Fig. 21 is a side cross-sectional view showing another alternative with two holders **50** and **50'**, similar to that of Fig. 18 but fully covering the top, bottom and sides of the units. Fig. 22 is a front view showing the holder of Fig. 21, and Fig. 23 is a top cross-sectional view.

Fig. 24 is a top cross-sectional view showing a holder which has two sections **50** and **50'** which are hinged to each other by a hinge **55**, shown folded shut. A catch **56** engages a notch **57** to hold the section together, or any other suitable catch or closure means could be used. Fig. 25 shows the Fig. 24 holder, folded open.

Fig. 26 is a front cross-sectional view showing a carousel arrangement of several units. The bins snap between top and bottom plates **60** and **61** respectively, mounted on a base **62**. A handle **63** is provided, for carrying or rotating the assembly. Fig. 27 is a top cross-sectional view of the Fig. 26 holder.

Fig. 28 is a perspective view showing a cylindrical version, where wedge-shaped bins are mounted between upper and lower plates **60** and **61** around a central post assembly **64**. Fig. 29 is a perspective view showing the Fig. 28 version with the bins open. Fig. 30 is a top cross-sectional view of the Fig. 28 version.

Fig. 31 is a perspective view showing a holder with three units arranged in a triangular fashion between top and bottom plates **60** and **61**. Fig. 32 is a top cross-sectional view showing the Fig. 31 holder

Fig. 33 is an exploded perspective view showing the units mountable in a tool box.

To summarize some possible variations on the holders, they can be attached to each other in a variety of ways:

- a. back-to-back such that drop-bins are accessible from either side;
- b. side-by-side such that drop-bins are accessible from the same side;
- c. holders can be molded and connected together via a living hinge. The holder, in this case, can be folded and secured back-to-back to provide access to the drop-bins from either side; or
- d. the holder can be swung open and be flat, in which case, all the drop bins are accessible from the same side.

Also, double-thickness holders can be molded that will accept drop-bins in either direction.

The holders can be fabricated in many shapes and configurations, having drop-bins of corresponding shapes:



- a. a circular holder around which drop-bins are installed. The holder can be rotated to select a particular bin/contents;
- b. the holder can be polygonal, inserted into a swivel base, and equipped with a turning knob at the top (to rotate holder);
- c. the holder can have a common wall (with or without a handle) onto which drop-bins can be attached from either side using various means (mentioned previously).

Yet another variation is that the holder could have a common vertical center wall, with drop-bin units secured to either side thereof by any suitable means.

Figs. 34 and 35 illustrate an alternative means of ganging the bins, i.e. instead of using gang bars. In this embodiment, the bins pivot on pins **75**. Pins **70** from one bin ride in a slot **71** in a flange **72** attached to the side of the adjacent bin. By virtue of the geometry of the slot **71**, rotating one bin **2** causes the wall of the slot to act on the pin of the adjacent bin, to cause that bin to rotate as well.

A further variation is that the width of the bins could be varied or split. For example, as shown in Fig. 36, one or more of the bins could be split into two separate bins, one ganged from one side and the other ganged from the other side.

Figs. 37A to 38C show drop-bin units **1** having a housing **4** and bins **2**, as described before. The drop-bin units further have at least one female dovetail **53**, preferably more than one, arranged on one side of the housing and the corresponding number of male dovetails **54** arranged on an opposite side of the housing. A number of drop-bin units **1** can thus be connected together by inserting male dovetails of one unit into the female dovetails of another unit, to create a chain of interconnected drop-bin units. Alternative inter-connection means to the dovetails can be used, as shown in Figs. 39A to 40D. Pins **53'** are arranged on one side of the housing, cooperating with side holes **54'** arranged on an opposite side of the housing. All further technical features are the same and use the same reference numbers. The pin is preferably shaped with a retaining flange or lip, to securely hold the pin in position once it is inserted into a corresponding side hole.

Figs. 41A to 41B show a further embodiment of drop-bin units **1** attached to each other via female dovetails **53** and male dovetails **54**, as described previously.

As is shown, dovetails may be arranged on sides of the drop-bin units, or on top and bottoms. It is also possible to arrange them on the backs of the units (not shown). A carrying handle 58, having a corresponding arrangement of female dovetail 53" and male dovetail 54", can be attached to a male dovetail 53 and a female dovetail 54, respectively, to fasten the handle so that the entire assembly of attached-together drop-bin units may be carried. This embodiment (and other embodiments above) is not limited to the use of dovetail connectors, any suitable type of connector is envisioned.

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